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Applicant: KRISTIINA YLIHONKO ET AL.

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Title: THE GENE CLUSTER INVOLVED IN ACLACINOMYCIN BIOSYNTHESIS,  
AND ITS USE FOR GENETIC ENGINEERING

**STATEMENT UNDER 37 C.F.R. §1.821(f)**

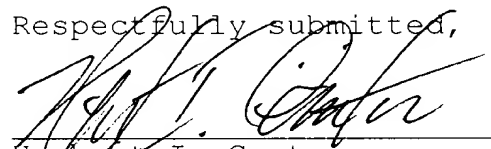
Commissioner for Patents  
Washington, DC 20231

Sir:

The undersigned hereby states that the contents of the paper copy of the sequence listing in the accompanying patent application and the accompanying computer readable copy of the sequence listing are the same.

Respectfully submitted,

May 2, 2001



Herbert I. Cantor

Registration No. 24,392

HIC:OAT

EVENSON, McKEOWN, EDWARDS  
& LENAHA, P.L.L.C.  
1200 G Street, N.W., Suite 700  
Washington, DC 20005  
Telephone No.: (202) 628-8800  
Facsimile No.: (202) 628-8844

## SEQUENCE LISTING

&lt;110&gt; YLIHONKO, Kristiina

RAETY, Kaj

HAKALA, Juha

<120> THE GENE CLUSTER INVOLVED IN ACLACINOMYCIN BIOSYNTHESIS, AND ITS USE  
FOR GENETIC ENGINEERING

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&lt;210&gt; 1

&lt;211&gt; 662

&lt;212&gt; PRT

&lt;213&gt; Streptomyces galilaeus

&lt;400&gt; 1

Met Thr Glu Asp Arg Val Thr Thr Leu Gly Gly Glu Gln Ile Ala Leu  
1 5 10 15Leu Ala Pro Leu Leu Asp Gly Ser Arg Asp Leu Pro Gly Ile Val Ala  
20 25 30Asp Ala Ala Pro Arg Leu Pro Ala Gly Leu Ala Glu Arg Leu Val Thr  
35 40 45Arg Leu Leu Asp Ala Gly Leu Leu Cys Ala Tyr Pro Gln Asp Gly Ala  
50 55 60Asp Arg Pro Glu Arg Ala Tyr Arg Ser Leu Thr Gly Leu Gln Ala Arg  
65 70 75 80

Ser Ala Asp Ala Arg Asp Ala Val Leu Ala Ala Val Asp Leu Thr Gly  
 85 90 95  
 Asp Ala Glu Ser Pro Leu Pro Glu Ala Val Ser Ala Ala Gly Leu Arg  
 100 105 110  
 Ala Ala Ala Pro Gly Glu His Ala Ala Leu Thr Leu Val Leu Cys His  
 115 120 125  
 Asp Tyr Leu Asp Pro Arg Leu Ser Ala Leu Asp Ala Glu His Arg Ala  
 130 135 140  
 Thr Gly Arg Gly Trp Leu Pro Val Arg Ala Asn Gly Thr His Leu Trp  
 145 150 155 160  
 Ile Gly Pro Phe Phe Ser Ala Gly Asp Gly Pro Cys Trp Ser Cys Leu  
 165 170 175  
 Ala Asp Arg Leu Arg Leu Arg Arg Arg Gly Glu Ala Tyr Val Gln His  
 180 185 190  
 Arg Leu Gly His Ser Gly Pro Ala Val His Arg Arg Ala Tyr Leu Pro  
 195 200 205  
 Ala Gly Arg Ala Ala Ala Leu Gln Leu Ala Leu Leu Glu Ala Gly Lys  
 210 215 220  
 Trp Leu Ser Gly His Arg Asp Thr Val Gln Asp Ser Leu Trp Arg Leu  
 225 230 235 240  
 Asp Thr Arg Thr Leu Glu Ser Ser Arg His Pro Val Arg Arg Arg Pro  
 245 250 255  
 Gln Cys Ser Arg Cys Gly Asp Pro Leu Leu Val Arg Asp Arg Val Ser  
 260 265 270  
 Ala Pro Val Val Leu Ser Ser Arg Pro Val Arg Asp Glu Ser Gly Gly  
 275 280 285  
 Gly His Arg Thr Phe Gly Pro Gln Glu Met Leu Asp Arg Tyr Gly His  
 290 295 300  
 Leu Val Asp Pro Val Thr Gly Val Val Gly Glu Ile Arg Arg Asp Pro  
 305 310 315 320  
 Arg Gly Pro Glu Phe Leu Asn Cys Phe Thr Arg Ser Arg Cys Arg Leu  
 325 330 335  
 Gly Pro Arg Ala Ala Pro Pro Ala Leu His Ser Pro Leu Arg Ser Pro  
 340 345 350  
 Gly Ser Gly Lys Gly Val Thr Glu Leu His Ala Arg Val Ser Ala Leu  
 355 360 365  
 Ala Glu Ala Leu Glu Arg Cys Ser Gly Tyr Phe Gln Gly Asp Glu Pro  
 370 375 380  
 Arg Arg Arg Gly Ser Tyr Arg Glu Leu Ala Gly Leu Ala Val His Pro  
 385 390 395 400  
 Asp Ser Val Gln Leu Phe Asp Arg Arg Gln Phe Glu Asp Arg Arg Ala  
 405 410 415

Trp Asn Arg Ala His Gly Pro Phe His Gln Val Thr Glu Pro Phe Asp  
 420 425 430  
 Glu Asp Ala Pro Ile Asp Trp Thr Pro Val Trp Ser Leu Thr Glu Arg  
 435 440 445  
 Arg Gln Arg Leu Ala Pro Thr Ser Leu Leu Tyr Tyr Asn Ala Pro Asp  
 450 455 460  
 Ala Asp Thr Gly Phe Cys Arg Ala Thr Ser Asn Gly Ala Ala Ala Gly  
 465 470 475 480  
 Thr Ser Leu Glu Asp Ala Val Val His Gly Cys Leu Glu Leu Val Glu  
 485 490 495  
 Arg Asp Ala Ile Ala Leu Trp Trp Tyr Asn Arg Thr Arg Gln Pro Gly  
 500 505 510  
 Val Thr Leu Asp Ala Arg Asp Pro Trp Ile Thr Arg Leu Arg Ala Val  
 515 520 525  
 Leu Arg Asp Leu Gly Arg Thr Val Trp Ala Leu Asp Leu Thr Ser Asp  
 530 535 540  
 Leu Gly Ile Pro Val Val Ala Ala Val Ser Val Arg Thr Gly Gly Thr  
 545 550 555 560  
 Ala Glu Asp Ile Val Leu Gly Phe Gly Ala His Phe Asp Pro Arg Ile  
 565 570 575  
 Ala Leu Arg Arg Ala Leu Thr Glu Leu Ser Gln Met Leu Pro Pro Leu  
 580 585 590  
 Ala Gln Glu Thr Ala Gly Asp Ala Ser Ala Tyr Thr Gly Thr Asp Pro  
 595 600 605  
 Glu Ala Met Arg Trp Phe Arg His Ala Thr Thr Ala Asn Gln Pro Tyr  
 610 615 620  
 Leu Leu Pro Ala Ala Arg Arg Ser Ala Arg Pro Pro Ala Ser Leu Arg  
 625 630 635 640  
 Pro Pro Arg Asp Ala Ala Ala Gln Ala Gly Ala Leu Val Ala Leu Leu  
 645 650 655  
 Arg Arg His Gly Leu Glu  
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<210> 2

<211> 272

<212> PRT

<213> Streptomyces galilaeus

<400> 2

Val Asp Ile Trp Leu Leu Gly Pro Leu Thr Ala Glu Val Arg Gly Arg  
 1 5 10 15

Ser Ile Val Pro Thr Ala Ala Lys Pro Arg Gln Ile Leu Ala Leu Leu  
 20 25 30  
 Ala Ile His Ala Asn Arg Val Leu Pro Val Gly Thr Leu Met Glu Glu  
 35 40 45  
 Ile Trp Gly Thr Glu Pro Pro Gln Ser Ala Leu Ala Thr Leu His Thr  
 50 55 60  
 Tyr Ile Leu Gln Leu Arg Arg Arg Leu Thr Ala Ala Tyr Gly Asp Glu  
 65 70 75 80  
 Gly Gly Val Ser Ala Lys Asp Val Leu Val Thr Gln Tyr Gly Gly Tyr  
 85 90 95  
 Cys Trp Gln Ala Pro Thr Asp Ser Val Asp Val Pro Arg Tyr Glu Arg  
 100 105 110  
 Leu Val Thr Ala Gly Arg Ile Ala Thr Ala Glu Asp Arg Gln Glu Glu  
 115 120 125  
 Ala Ser Ala His Phe Arg Glu Ala Leu Ala Leu Trp Arg Gly Ser Ala  
 130 135 140  
 Leu Val Asp Val Arg Ile Gly Pro Val Leu Ser Ile Glu Val Ala Arg  
 145 150 155 160  
 Leu Glu Glu Ser Arg Leu Gly Val Leu Glu Arg Cys Leu Glu Ala Asp  
 165 170 175  
 Leu Arg Leu Gly Arg His Ala Glu Leu Leu Ala Glu Leu Thr Glu Leu  
 180 185 190  
 Thr Gly Arg His Pro Leu His Glu Gly Leu His Ala Gln Cys Met Thr  
 195 200 205  
 Ala Leu Tyr Arg Ala Gly Arg Ser Trp Gln Ala Leu Asp Val Tyr Gln  
 210 215 220  
 Arg Leu Arg Arg Arg Leu Ala Glu Glu Leu Gly Leu Ser Pro Ser Pro  
 225 230 235 240  
 Arg Leu Gln Arg Leu Gln Gln Ala Val Leu Ser Ala Glu Pro Trp Leu  
 245 250 255  
 Asp Ala Pro Arg Tyr Gly Gly Asp Pro Val Phe Asp Arg Met Ile Ser  
 260 265 270

<210> 3

<211> 434

<212> PRT

<213> Streptomyces galilaeus

<400> 3

Met Thr Ser Asp Thr Lys Ala Leu Val Leu Glu Gln Val Arg Glu Tyr  
 1 5 10 15

His Arg Gln Gln Gln Pro Gly Asn Phe Gln Pro Gly Val Thr Pro Ile  
 20 25 30  
 Leu Ser Ser Gly Ala Val Leu Asp Glu Glu Asp Arg Val Ala Leu Val  
 35 40 45  
 Glu Ala Ala Leu Asp Leu Arg Ile Ala Ala Gly Ala His Ser Arg Arg  
 50 55 60  
 Phe Glu Ser Lys Phe Ala Arg His Ile Gly Val Arg Lys Ala His Leu  
 65 70 75 80  
 Val Asn Ser Gly Ser Ser Ala Asn Leu Leu Ala Leu Ser Ala Leu Thr  
 85 90 95  
 Ser Pro Arg Leu Gly Glu Gln Arg Leu Arg Pro Gly Asp Glu Val Ile  
 100 105 110  
 Thr Val Ala Gly Gly Phe Pro Thr Thr Val Asn Pro Ile Leu Gln Asn  
 115 120 125  
 Gly Leu Thr Pro Val Phe Val Asp Leu Glu Leu Gly Thr Tyr Asn Thr  
 130 135 140  
 Thr Val Glu His Val Arg Ala Ala Ile Ser Asp Arg Thr Arg Ala Ile  
 145 150 155 160  
 Met Ile Ala His Thr Leu Gly Asn Pro Tyr Gln Val Ala Glu Ile Gln  
 165 170 175  
 Gln Leu Ala Thr Glu His Glu Leu Phe Leu Ile Glu Asp Asn Cys Asp  
 180 185 190  
 Ala Val Gly Ser Thr Tyr Gln Gly Arg Met Thr Gly Thr Phe Gly Asp  
 195 200 205  
 Leu Ala Thr Val Ser Phe Tyr Pro Ala His His Ile Thr Thr Gly Glu  
 210 215 220  
 Gly Gly Cys Val Leu Thr Arg Asn Leu Glu Leu Ala Arg Ile Val Glu  
 225 230 235 240  
 Ser Phe Arg Asp Trp Gly Arg Asp Cys Trp Cys Glu Pro Gly Glu Asp  
 245 250 255  
 Asn Thr Cys Leu Lys Arg Phe Asp Tyr Gln Leu Gly Asn Leu Pro Lys  
 260 265 270  
 Gly Tyr Asp His Lys Tyr Ile Phe Ser His Ile Gly Tyr Asn Leu Lys  
 275 280 285  
 Ala Thr Asp Leu Gln Gly Ala Leu Ala Leu Ser Gln Leu Asn Lys Leu  
 290 295 300  
 Pro Glu Phe Gly Ala Ala Arg Arg Arg Asn Trp Gln Arg Leu Arg Asp  
 305 310 315 320  
 Gly Leu Ala Asp Val Pro Gly Leu Leu Leu Pro Val Ala Thr Pro Gly  
 325 330 335  
 Ser Asp Pro Ser Trp Phe Gly Phe Val Ile Thr Val Leu Pro Asp Ala  
 340 345 350

Thr Tyr Thr Arg Arg Asp Leu Val Ala Phe Leu Glu Glu Arg Arg Ile  
 355 360 365  
 Gly Thr Arg Arg Leu Phe Gly Gly Asn Leu Thr Arg His Pro Ala Tyr  
 370 375 380  
 Leu Gly Thr Pro His Arg Val Ala Gly Asp Leu Arg Asn Ser Asp Ile  
 385 390 395 400  
 Ile Thr Glu Gln Ser Phe Trp Ile Gly Val Tyr Pro Gly Ile Thr Glu  
 405 410 415  
 Glu Met Thr Asp Tyr Met Arg Glu Ser Ile Val Glu Phe Val Thr Lys  
 420 425 430  
 Asn Gly

<210> 4

<211> 329

<212> PRT

<213> Streptomyces galilaeus

<400> 4

Met Pro Lys Asp Thr Pro Arg Pro Val Leu Arg Ile Gly Val Leu Gly  
 1 5 10 15  
 Cys Ala Asp Ile Ala Val Arg Arg Ile Leu Pro Ala Ile Val Glu His  
 20 25 30  
 Pro Ser Val Arg Leu Val Ala Leu Ala Ser Arg Asp Gly Ala Arg Ala  
 35 40 45  
 Glu Arg Leu Ala Ala Arg Phe Gly Cys Ala Ala Val Thr Gly Tyr Lys  
 50 55 60  
 Ala Leu Leu Asp Arg Glu Asp Ile Asn Ala Val Tyr Val Pro Leu Pro  
 65 70 75 80  
 Pro Gly Met His His Glu Trp Val Thr Glu Ala Leu Thr Ala Gly Lys  
 85 90 95  
 His Val Leu Val Glu Lys Pro Leu Ser Thr Thr Tyr Ala Gln Ser Val  
 100 105 110  
 Asp Leu Val Ala Met Ala Gly Arg Leu Gly Leu Ala Leu Thr Glu Asn  
 115 120 125  
 Phe Met Phe Leu His His Ser Gln His Glu Ala Val Arg Ala Met Thr  
 130 135 140  
 Gly Glu Ile Gly Glu Leu Arg Val Phe Thr Ser Ser Phe Gly Val Pro  
 145 150 155 160  
 Pro Pro His Pro Ser Ser Phe Arg His Asp Ala Arg Leu Gly Gly Gly  
 165 170 175

Ala	Leu	Leu	Asp	Val	Gly	Val	Tyr	Pro	Leu	Arg	Ala	Ala	Gln	Leu	His
			180					185					190		
Leu	Ala	Gly	Glu	Leu	Asp	Val	Leu	Gly	Ala	Cys	Leu	Arg	Val	Asp	Glu
		195					200					205			
Ala	Thr	Gly	Val	Asp	Val	Ala	Gly	Ser	Ala	Leu	Leu	Ser	Thr	Ala	Thr
	210					215					220				
Gly	Val	Thr	Ala	Gln	Leu	Asp	Phe	Gly	Phe	Gln	His	Ala	Tyr	Arg	Ser
225					230					235					240
Val	Tyr	Ala	Leu	Trp	Gly	Ser	Arg	Gly	Arg	Leu	Ser	Val	Pro	Arg	Ala
			245					250					255		
Phe	Thr	Pro	Pro	Arg	Glu	His	Arg	Pro	Val	Val	Arg	Ile	Glu	Gln	Gln
		260						265					270		
Asp	Arg	Leu	Thr	Glu	Val	Thr	Leu	Pro	Ala	Asp	His	Gln	Val	Gly	Asn
		275					280					285			
Ala	Leu	Asp	Ala	Phe	Ala	Ser	Ala	Val	His	Ser	Glu	Thr	Val	Arg	Ala
	290					295					300				
Ser	Leu	Gly	Glu	Ala	Leu	Leu	Arg	Gln	Ala	Leu	Leu	Val	Glu	Gln	Val
305					310					315					320
Arg	Lys	Ala	Ala	Arg	Val	Val	Ser	Gly							
				325											

<210> 5

<211> 323

<212> PRT

<213> Streptomyces galilaeus

<400> 5

Met	Arg	Val	Leu	Ile	Thr	Gly	Gly	Ala	Gly	Phe	Ile	Gly	Ser	His	Tyr
1				5					10					15	
Val	Arg	Ser	Leu	Leu	Ala	Gly	Thr	Leu	Pro	Gly	Pro	Arg	Pro	Ser	Arg
			20					25					30		
Val	Thr	Val	Val	Asp	Leu	Leu	Thr	Tyr	Ala	Gly	Asp	Thr	Gly	Asn	Leu
	35						40					45			
Pro	Leu	Ala	Asp	Pro	Arg	Leu	Asp	Phe	Arg	Arg	Leu	Asp	Ile	Arg	Asp
	50					55					60				
Leu	Asp	Ala	Leu	Leu	Thr	Val	Val	Pro	Gly	His	Asp	Ala	Val	Val	His
65					70					75					80
Phe	Ala	Ala	Glu	Thr	His	Val	Asp	Arg	Ser	Leu	Ser	Glu	Pro	Ala	Glu
			85						90					95	
Phe	Val	Arg	Thr	Asn	Val	Leu	Gly	Thr	Gln	Ser	Leu	Leu	Glu	Ala	Ser
			100					105					110		



Leu Arg Gly Gly Val Gly Thr Phe Val His Val Ser Thr Asp Glu Val  
 115 120 125  
 Tyr Gly Ser Ile Ala Gln Gly Thr Trp Thr Glu Glu Ala Pro Leu Leu  
 130 135 140  
 Pro Asn Ser Pro Tyr Ala Ala Ser Lys Ala Gly Ser Asp Leu Val Ala  
 145 150 155 160  
 Arg Ser Tyr Trp Arg Thr His Gly Leu Asp Val Arg Thr Thr Arg Cys  
 165 170 175  
 Ala Asn Asn Tyr Gly Pro Arg Gln His Pro Glu Lys Leu Ile Pro Leu  
 180 185 190  
 Phe Val Thr Glu Leu Leu Ala Gly Arg Pro Val Pro Leu Tyr Gly Asp  
 195 200 205  
 Gly Gly Asn Val Arg Glu Trp Leu His Val Asp Asp His Cys Arg Ala  
 210 215 220  
 Val His Ala Val Leu Thr Gly Gly Arg Pro Gly Glu Ile Tyr Asn Ile  
 225 230 235 240  
 Gly Gly Gly Thr His Leu Thr Asn Arg Glu Met Thr Ala Lys Leu Leu  
 245 250 255  
 Ala Leu Cys Gly Thr Asp Trp Ser Arg Val Arg Gln Val Pro Asp Arg  
 260 265 270  
 Lys Gly His Asp Leu Arg Tyr Ala Val Asp Asp Thr Lys Ile Arg Glu  
 275 280 285  
 Glu Leu Gly Tyr Arg Pro Leu Arg Ser Leu Asp Asp Gly Leu Arg Glu  
 290 295 300  
 Val Val Asp Trp Tyr Arg Asp Arg Gln Thr His Arg Pro Glu Pro Ala  
 305 310 315 320  
 Glu Arg Val

<210> 6

<211> 443

<212> PRT

<213> Streptomyces galilaeus

<400> 6

Met Arg Val Leu Leu Thr Ser Phe Ala Leu Asp Ala His Phe Asn Gly  
 1 5 10 15  
 Ser Val Pro Leu Ala Trp Ala Leu Arg Ala Ala Gly His Glu Val Arg  
 20 25 30  
 Val Ala Ser Gln Pro Ala Leu Thr Ala Ser Ile Thr Ala Ala Gly Leu  
 35 40 45

Thr	Ala	Val	Pro	Val	Gly	Ala	Asp	Pro	Arg	Leu	Asp	Glu	Met	Val	Lys	50	55	60	
Gly	Val	Gly	Asp	Ala	Val	Leu	Ser	His	His	Ala	Asp	Gln	Ser	Leu	Asp	65	70	75	80
Ala	Asp	Thr	Pro	Gly	Gln	Leu	Thr	Pro	Ala	Phe	Leu	Gln	Gly	Trp	Asp	85	90	95	
Thr	Met	Met	Thr	Ala	Thr	Phe	Tyr	Thr	Leu	Ile	Asn	Asp	Asp	Pro	Met	100	105	110	
Val	Asp	Asp	Leu	Val	Ala	Phe	Ala	Arg	Gly	Trp	Glu	Pro	Asp	Leu	Ile	115	120	125	
Leu	Trp	Glu	Pro	Phe	Thr	Phe	Ala	Gly	Ala	Val	Ala	Ala	Lys	Val	Thr	130	135	140	
Gly	Ala	Ala	His	Ala	Arg	Leu	Leu	Ser	Phe	Pro	Asp	Leu	Phe	Met	Ser	145	150	155	160
Met	Arg	Arg	Ala	Tyr	Leu	Ala	Gln	Leu	Gly	Ala	Ala	Pro	Ala	Gly	Pro	165	170	175	
Ala	Gly	Gly	Asn	Gly	Thr	Thr	His	Pro	Asp	Asp	Ser	Leu	Gly	Gln	Trp	180	185	190	
Leu	Glu	Trp	Thr	Leu	Gly	Arg	Tyr	Gly	Val	Pro	Phe	Asp	Glu	Glu	Ala	195	200	205	
Val	Thr	Gly	Gln	Trp	Ser	Val	Asp	Gln	Val	Pro	Arg	Ser	Phe	Arg	Pro	210	215	220	
Pro	Ser	Asp	Arg	Pro	Val	Val	Gly	Met	Arg	Tyr	Val	Pro	Tyr	Asn	Gly	225	230	235	240
Pro	Gly	Pro	Ala	Val	Val	Pro	Asp	Trp	Leu	Arg	Val	Pro	Pro	Thr	Arg	245	250	255	
Pro	Arg	Val	Cys	Val	Thr	Leu	Gly	Met	Thr	Ala	Arg	Thr	Ser	Glu	Phe	260	265	270	
Pro	Asn	Ala	Val	Pro	Val	Asp	Leu	Val	Leu	Lys	Ala	Val	Glu	Gly	Leu	275	280	285	
Asp	Ile	Glu	Val	Val	Ala	Thr	Leu	Asp	Ala	Glu	Glu	Arg	Ala	Leu	Leu	290	295	300	
Thr	His	Val	Pro	Asp	Asn	Val	Arg	Leu	Val	Asp	His	Val	Pro	Leu	His	305	310	315	320
Ala	Leu	Leu	Pro	Thr	Cys	Ala	Ala	Ile	Val	His	His	Gly	Gly	Ala	Gly	325	330	335	
Thr	Trp	Ser	Thr	Ala	Leu	Val	Glu	Gly	Val	Pro	Gln	Ile	Ala	Met	Gly	340	345	350	
Trp	Ile	Trp	Asp	Ala	Ile	Asp	Arg	Ala	Gln	Arg	Gln	Gln	Ala	Leu	Gly	355	360	365	
Ala	Gly	Leu	His	Leu	Pro	Ser	His	Glu	Val	Thr	Val	Glu	Gly	Leu	Arg	370	375	380	

Gly Arg Leu Val Arg Leu Leu Asp Glu Pro Ser Phe Thr Ala Ala Ala  
 385 390 395 400  
 Ala Arg Leu Arg Ala Glu Ala Glu Ser Glu Pro Thr Pro Ala Gln Val  
 405 410 415  
 Val Pro Val Leu Glu Arg Leu Thr Ala Gln His Arg Ala Arg Glu Pro  
 420 425 430  
 Arg Arg Pro Gly Gly Thr Ser Pro Cys Val Ser  
 435 440

<210> 7

<211> 443

<212> PRT

<213> Streptomyces galilaeus

<400> 7

Val Gln Thr Gln Asn Ala Pro Glu Thr Ala Glu Asn Gln Gln Thr Asp  
 1 5 10 15  
 Ser Glu Leu Gly Arg His Leu Leu Thr Ala Arg Gly Phe His Trp Ile  
 20 25 30  
 Tyr Gly Thr Ser Gly Asp Pro Tyr Ala Leu Thr Leu Arg Ala Glu Ser  
 35 40 45  
 Asp Asp Pro Ala Leu Leu Thr Arg Arg Ile Arg Glu Ala Gly Thr Pro  
 50 55 60  
 Leu Trp Gln Ser Thr Thr Gly Ala Trp Val Thr Gly Arg His Gly Val  
 65 70 75 80  
 Ala Ala Glu Ala Leu Ala Asp Pro Arg Leu Ala Leu Arg His Ala Asp  
 85 90 95  
 Leu Pro Gly Pro Gln Arg His Val Phe Ser Asp Ala Trp Ser Asn Pro  
 100 105 110  
 Gln Leu Cys His Ile Ile Pro Leu Asp Arg Ala Phe Leu His Ala Ser  
 115 120 125  
 Asp Ala Asp His Thr Arg Trp Ala Arg Ser Ala Ser Ala Val Leu Gly  
 130 135 140  
 Ser Ala Gly Gly Ala Pro Ala Glu Gly Val Arg Glu His Ala Gly Arg  
 145 150 155 160  
 Val His Arg Glu Ala Ala Asp Arg Thr Gly Asp Ser Phe Asp Leu Met  
 165 170 175  
 Ala Asp Tyr Ser Arg Pro Val Ala Thr Glu Ala Ala Ala Glu Leu Leu  
 180 185 190  
 Gly Val Pro Ala Ala Gln Arg Glu Arg Phe Ala Ala Thr Cys Leu Ala  
 195 200 205

Leu Gly Val Ala Leu Asp Ala Ala Leu Cys Pro Gln Pro Leu Ala Val  
 210 215 220  
 Thr Arg Arg Leu Thr Glu Ala Val Glu Asp Val Arg Ala Leu Val Gly  
 225 230 235 240  
 Asp Leu Val Glu Ala Arg Arg Thr Gln Pro Gly Asp Asp Leu Leu Ser  
 245 250 255  
 Ala Val Leu His Ala Gly Ser Ser Ala Ala Ser Ala Gly Gln Asp Ala  
 260 265 270  
 Leu Ala Val Gly Val Leu Thr Ala Val Val Gly Val Glu Val Thr Ala  
 275 280 285  
 Gly Leu Ile Asn Asn Thr Leu Glu Ser Leu Leu Thr Arg Pro Val Gln  
 290 295 300  
 Trp Ala Arg Leu Gly Glu Asn Pro Glu Leu Ala Ala Gly Ala Val Glu  
 305 310 315 320  
 Glu Ala Leu Arg Phe Ala Pro Pro Val Arg Leu Glu Ser Arg Ile Ala  
 325 330 335  
 Ala Glu Asp Leu Thr Leu Gly Gly Gln Asp Leu Pro Ala Gly Ala Gln  
 340 345 350  
 Val Val Val His Val Gly Ala Ala Asn Arg Asp Pro Glu Ala Phe Leu  
 355 360 365  
 Ala Pro Asp His Phe Asp Leu Asp Arg Pro Ala Gly Gln Gly Gln Leu  
 370 375 380  
 Ser Leu Ser Gly Pro His Thr Ala Leu Phe Gly Ala Phe Ala Arg Leu  
 385 390 395 400  
 Gln Ala Glu Thr Ala Val Arg Thr Leu Arg Glu Arg Arg Pro Val Leu  
 405 410 415  
 Ala Pro Ala Gly Ala Val Leu Arg Arg Met Arg Ser Pro Val Leu Gly  
 420 425 430  
 Ala Val Leu Arg Phe Pro Leu Thr Thr Ser Ala  
 435 440

<210> 8

<211> 267

<212> PRT

<213> Streptomyces galilaeus

<400> 8

Val Asn Arg Ala Ala Arg Pro Thr Val Arg Gly Met Ser Ala Ile Ala  
 1 5 10 15  
 Glu Pro Thr Ala Pro Arg Gly Val Ile Val Thr Gly Gly Gly Thr Gly  
 20 25 30

Ile Gly Arg Ala Thr Ala His Ala Phe Ala Asp Arg Gly Asp Arg Val  
 35 40 45  
 Leu Val Val Gly Arg Thr Ala Ala Thr Leu Ala Gly Thr Ala Glu Gly  
 50 55 60  
 His Pro Gly Ile Ser Val Leu Thr Ala Asp Leu Thr Asp Pro Asp Gly  
 65 70 75 80  
 Pro Arg Ala Ile Thr Asp Ala Ala Leu Asp Ala Leu Gly Arg Ile Asp  
 85 90 95  
 Val Leu Val Asn Asn Ala Ala Thr Gly Gly Phe Ala Gly Leu Ala Glu  
 100 105 110  
 Thr Glu Pro Glu Ala Ala Arg Glu Gln Phe Asp Ser Asn Leu Leu Ala  
 115 120 125  
 Pro Leu Leu Leu Thr Arg Gln Thr Leu Asp Ala Leu Ser Ala Asp Gly  
 130 135 140  
 Gly Gly Thr Val Leu Asn Ile Gly Ser Ala Gly Ala Leu Gly Arg Arg  
 145 150 155 160  
 Ala Trp Pro Gln Asn Gly Val Tyr Gly Ala Ala Lys Ala Gly Leu Asp  
 165 170 175  
 Phe Leu Thr Arg Thr Trp Ala Val Glu Leu Ala Pro Arg Gly Ile Arg  
 180 185 190  
 Val Leu Gly Leu Ala Pro Gly Val Ile Asp Thr Gly Ile Gly Glu Arg  
 195 200 205  
 Ser Gly Met Ser Arg Glu Ala Tyr Ala Gly Phe Leu Gly Gln Ile Ala  
 210 215 220  
 Ala Arg Val Pro Ala Gly Arg Val Gly Arg Pro Glu Asp Ile Ala Trp  
 225 230 235 240  
 Trp Ala Val Gln Leu Ala Asp Pro Arg Ala Ala Tyr Ala Thr Gly Ala  
 245 250 255  
 Val Leu Ala Val Asp Gly Gly Leu Ser Leu Thr  
 260 265

<210> 9

<211> 144

<212> PRT

<213> Streptomyces galilaeus

<400> 9

Met Thr Ala Gln Ala Pro Thr Ala Pro Ala Asp Val Tyr Ala Glu Val  
 1 5 10 15  
 Gln His Phe Tyr Ala Arg Gln Met Arg Tyr Leu Asp Ser Gly Glu Ala  
 20 25 30

Glu Thr Trp Ala Gly Thr Phe Thr Glu Asp Gly Ser Phe Ala Pro Pro  
 35 40 45  
 Ser Leu Pro Glu Pro Val Arg Gly Arg Pro Leu Leu Ala Glu Gly Ala  
 50 55 60  
 Arg Asn Ala Ala Ala Gly Leu Ala Ala Ala Arg Glu Thr His Arg His  
 65 70 75 80  
 Trp Val Gly Met Leu Thr Val Thr Pro Ala Asp Asp Gly Ser Leu Thr  
 85 90 95  
 Ala Glu Ser Leu Val Ser Ile Val Ala Val Ala Gln Gly Gly Pro Ala  
 100 105 110  
 Arg Leu His Leu Val Cys Thr Cys Arg Asp Val Leu Val Arg Glu Gly  
 115 120 125  
 Gly Arg Leu Leu Val Arg Glu Arg Val Val Thr Arg Asp Asp Arg Pro  
 130 135 140

<210> 10

<211> 259

<212> PRT

<213> Streptomyces galilaeus

<400> 10

Val Arg Ile Ile Asp Leu Ser Ser Pro Val Asp Ala Ala Gly Phe Glu  
 1 5 10 15  
 Pro Asp Pro Val Val His Asp Val Leu Gly Pro Lys Glu Ala Ala Thr  
 20 25 30  
 His Met Ser Glu Glu Met Arg Glu His Phe Gly Ile Asp Phe Asp Pro  
 35 40 45  
 Ala Glu Leu Pro Glu Gly Glu Phe Leu Ser Leu Asp Arg Leu Gln Leu  
 50 55 60  
 Thr Thr His Thr Gly Thr His Val Asp Ala Pro Ser His Tyr Gly Thr  
 65 70 75 80  
 Arg Ala Ala Tyr Arg Asp Gly Pro Pro Arg His Ile Asp Glu Met Pro  
 85 90 95  
 Leu Asp Trp Phe Phe Arg Pro Ala Val Val Leu Asp Leu Ser Asp Gln  
 100 105 110  
 Gly Thr Gly Ala Val Gly Ala Asp Val Leu Arg Arg Glu Met Asp Arg  
 115 120 125  
 Ile Gly His Thr Pro Ser Pro Met Asp Ile Val Leu Leu Arg Thr Gly  
 130 135 140  
 Ala Asp Ala Trp Ala Gly Thr Pro Lys Tyr Phe Thr Asp Phe Thr Gly  
 145 150 155 160

Leu Asp Gly Ser Ala Val His Leu Leu Leu Asp Leu Gly Val Arg Val  
 165 170 175  
 Ile Gly Thr Asp Ala Phe Ser Leu Asp Ala Pro Phe Gly Asp Ile Ile  
 180 185 190  
 Thr Arg Tyr Arg Ala Thr Gly Asp Pro Ser Val Leu Trp Pro Ala His  
 195 200 205  
 Val Ile Gly Arg Asp Arg Glu Tyr Cys Gln Val Glu Arg Leu Ala Gly  
 210 215 220  
 Leu Asp Arg Leu Pro Ala Ala His Gly Phe Arg Val Ala Cys Phe Pro  
 225 230 235 240  
 Val Arg Ile Ala Gly Ala Gly Ala Gly Trp Thr Arg Ala Val Ala Leu  
 245 250 255  
 Val Asp Glu

<210> 11

<211> 238

<212> PRT

<213> Streptomyces galilaeus

<400> 11

Met Tyr Gly Arg Glu Leu Ala Asp Val Tyr Glu Ala Ile Tyr Arg Ser  
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 Arg Thr Tyr Asp Ala Val Ser Cys Met Phe Cys Ala Ile Gly Tyr Leu  
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<213> Streptomyces galilaeus

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Gly Cys Val Leu Phe Gly Tyr Pro Val Glu Asp Pro Glu Arg Tyr Gly  
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Val Gly Glu Thr Asp Ala Ser Gly Gln Leu Val Ser Leu Glu Glu Lys  
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Asp Asn Glu Val Val Asp Ile Ala Lys Asn Leu Arg Pro Ser Pro Arg  
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<213> Streptomyces galilaeus

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Ala Ala Ala Phe Ser Phe Tyr Pro Thr Lys Val Leu Gly Ala Tyr Gly  
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Thr Pro Gly His Asn Ala Arg Leu Asp Glu Val Gln Ala Glu Ile Leu  
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Val Ala Arg Arg Tyr Glu Asp Gly Leu Gly Asp Thr Gly Leu Val Leu  
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Pro His Thr Val Pro Gly Asn Glu His Val Tyr Tyr Val Tyr Thr Val  
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Arg His Pro Arg Arg Asp Asp Ile Ile Lys Ala Leu Lys Ala Tyr Asp  
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